

MasterClass

Dr. Jane Goodall

Teaches Conservation





ABOUT
JANE GOODALL

Dr. Jane was born on April 3, 1934 in London, England. Always a lover of animals, she dreamed of traveling to Africa to study wildlife. She was invited to a school mate's family farm in Kenya in 1957 and a few months later, Dr. Jane met Dr. Louis Leakey, then curator of the Coryndon Museum in Nairobi. Leakey, impressed by Dr. Jane's enthusiasm, knowledge of nature, and natural history, asked her to be his secretary. He believed she would be the right person to study then little-known chimpanzees. In the summer of 1960, Dr. Jane traveled to Gombe Stream National Park in Tanzania to begin her observations. She immersed herself in the chimpanzee habitat and defied scientific convention by giving chimpanzees names instead of numbers. Dr. Jane witnessed a chimpanzee using a twig to fish termites from a nest, thus revealing humans were not the only creatures to use tools. Now a UN Messenger of Peace, Dr. Jane travels more than 300 days each year to speak about the challenges facing chimpanzees and the environment.

WELCOME TO CLASS

This workbook is meant to be used as a companion text to Dr. Jane's MasterClass. In the lesson videos, Dr. Jane provides a jumping-off point, giving you the inspiration and high-level information that will motivate you to dig deeper into animal behavior, conservation, and activism through research of your own.

Dr. Jane hopes to share with you details of her story that have never been recorded before, the behavioral similarities and differences of chimpanzees and humans, impactful stories tying animals, the environment and humans together, as well as an outline of the troubles facing mankind for MasterClass students to discuss and collaboratively combat.

Dr. Jane and MasterClass thank you for beginning your education in conservation. You are essential to the future of this planet and the key to saving it.

SUGGESTED READING

Read and reference the following books and stories to prepare yourself for Dr. Jane's teachings throughout her MasterClass. Take notes and discuss with your friends and families.

FOR ADULTS

- *In the Shadow of Man* by Dr. Jane Goodall
- *Through a Window and Patterns of Behavior* by Dr. Jane Goodall
- *My Life with the Chimpanzees* by Dr. Jane Goodall
- *The Chimpanzee Family Book* by Jane Goodall
- *Harvest for Hope : A Guide to Mindful Eating* by Dr. Jane Goodall
- *Seeds of Hope: Wisdom and Wonder from the World of Plants* by Dr. Jane Goodall
- *Hope for Animals and Their World: How Endangered Species Are Being Rescued from the Brink* by Dr. Jane Goodall
- *Reason for Hope* by Dr. Jane Goodall
- *The Ten Trusts: What We Must Do to Care for the Animals We Love* by Dr. Jane Goodall
- *Rickie and Henri: A True Story* by Dr. Jane Goodall

FOR CHILDREN

- *Me ... Jane* by Patrick McDonnel
- *I am Jane Goodall* by Brad Meltzer
- *A Prayer for World Peace* by Dr. Jane Goodall
- *The Chimpanzees I Love: Saving Their World and Ours* by Dr. Jane Goodall
- *Dr. White* by Dr. Jane Goodall
- *The Eagle & the Wren* by Dr. Jane Goodall
- *With Love* by Dr. Jane Goodall





THINGS YOU MIGHT NEED

SUPPLIES AND MATERIALS

While we've included a notes page after each chapter, you may want to have a notebook nearby for moments of inspiration. For observations outdoors, we recommend taking a camera, binoculars, and a mobile device for emergency communications.

COLLABORATE TOGETHER

LESSON DISCUSSIONS

Use the discussion section under each lesson video to discuss the topics Dr. Jane presents with your peers. These topics may be controversial to some, so listen and speak to others with compassion and understanding.

THE HUB

Continue connecting with your MasterClass peers by using our community features.

2.

DREAMS OF AFRICA

"What my mother said to me is what I say to young people all around the world: 'If there's something you really want, you're going to have to work really hard and take advantage of [opportunities] and above all, never give up.'"
—Jane Goodall

SUBCHAPTERS

CHAPTER REVIEW

Have you ever wondered what drew great scientists to their professions? For Dr. Jane, it started with earthworms.

At 18 months old, her first scientific experiment occurred when she took a handful of wriggling earthworms to bed with her. Jane's mother, who supported her fascination with animals, told Jane that the worms would die without the earth, so they took them back to the garden together.

Before World War II, Jane lived with her family in London. There weren't many wild animals in the city except for sparrows and pigeons, and domesticated dogs and cats. When she was four and a half, Jane's mother took her for a holiday in the country on a proper farm, where animals roamed around in the fields and hens pecked around in the farmyard.

She was given a job to help collect the hens' eggs. Jane would put eggs into her basket, but was left wondering where the eggs came from. Jane tried following the hens into the chicken coop to watch them lay eggs, but they kept running out. Jane decided that to find out for herself, she needed to hide in the chicken coop until a hen laid an egg. Jane was very quiet and very still. She waited four hours before she witnessed a hen lay an egg. Meanwhile, her family was searching for her, unbeknownst to Jane. When she emerged from the coop, instead of being angry with her, Jane's mother was delighted. She listened to Jane explain how a hen lays an egg.

Today, Jane loves this story because it demonstrates the making of a little scientist in her four-and-a-half-year-old self. All the qualities of a scientist were present in her: curiosity, asking questions, not getting the right answer, deciding to find out for herself, making a mistake, not giving up, and learning patience.

Jane first fell in love with Africa when she read *The Story of Doctor Dolittle* by Hugh Lofting. When she was eight years old, she checked this book out from the library. Dr. Dolittle's pet parrot named Polynesia teaches him that a dog's body language and

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DREAMS OF AFRICA

behavior indicate things about the dog's emotions. Polynesia goes through all the household animals in this way. *The Story of Doctor Dolittle* is a study of ethology.

Another book, *Tarzan of the Apes* by Edgar Rice Burroughs, helped Jane focus her dream. After reading the book from cover to cover, she decided that when she grew up, she would go to Africa. She would live with wild animals and write books about them. She told everybody about her dream, and everyone laughed at her. They said, "Jane, dream about something you can achieve. You can't get to Africa. It takes a lot of money." There were no airplanes going back and forth to Africa in those days.

They told Jane, "You're just a girl." This was 70 years ago when women didn't have the same opportunities as men. Men could have exciting careers, but not women. They were supposed to be nurses or secretaries, or wives and mothers. Jane's mother, however, always encouraged her dreams. She told Jane that if she worked hard, took advantage of opportunities, and never gave up, she would achieve her goals.

Jane studied hard in school, got a job in London, and also worked as a waitress in her hometown in order to save money for her first trip to Africa. It took her about six months to get enough money for a return fare.

Jane left England in the winter. The sea was gray and the air was cold, but as the boat moved further south, the air got warmer and the sea got bluer. There were exotic smells coming from the coast. Jane can still remember the first dolphins leaping around the boat.

She was so excited, but after landing in Cape Town, she was shocked at the segregation in town. In such a beautiful place, Jane could not believe that on all the seats, hotels, and bathrooms were signs saying "Whites Only." Jane was saddened by this, but reminded herself of her goal: to study the animals of Africa. She got to Nairobi, Kenya and stayed with her friend. On her first night, there was a big male leopard leaving his tracks right outside her window. Jane had really arrived in Africa.

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DREAMS OF AFRICA

A big opportunity presented itself through Dr. Louis Leakey, who had spent his life searching for the fossilized remains of our earliest hominid ancestors. Dr. Leakey took Jane around the Natural History Museum in Nairobi where he was a curator. He asked Jane many questions which she was able to answer because of all the reading about Africa she had done. Dr. Leakey invited Jane to dig for fossils in Olduvai Gorge. He was impressed with Jane's knowledge and work, so he gave her the opportunity to go and study chimpanzees—not just any animal, but the one most like us.

Dr. Leakey believed that about six million years ago there was an ape-like/human-like creature ancestral to humans on the one hand and to apes on the other. He felt that if Jane found behaviors in chimps that were similar or maybe identical to behaviors we see in humans today, perhaps that behavior was also present in the common ancestor. Jane agreed, but she had to bring a chaperone. She chose her mother. Thus began Jane's long and fruitful study of chimpanzees.

LEARN MORE

- Learn more about hens and the issues they face in the world here. Then, use the website Local Hens to find farms near you that offer classes on collecting eggs, chicken keeping, and more.

2.

NOTES

3.

THE BREAKTHROUGH

"I really felt for the first time that I was accepted, that this peculiar, white ape was now no longer a threat."
—Jane Goodall

SUBCHAPTERS

- Arriving in Gombe
- Observing the Chimps
- The Breakthrough
- Communicating with David Greybeard

CHAPTER REVIEW

Jane will never forget her arrival in Gombe. She approached the forest in a boat on the lake, gazing at the hills and valleys with thick forest and open ridges between. In the forest of Gombe, Jane lived in an old-fashioned army tent with her mother. They brought canned food that they had bought from the nearest little town. When Jane looked into the forested area, she thought, "How on earth am I going to find the chimpanzees in this place?" There was no precedent for her to follow. There was nobody to tell her how to study the chimps. Dr. Leakey didn't come with her. She was on her own, and it was all up to her.

From the beginning, Jane realized that if she was going to learn about chimpanzees, she would have to spend every daylight hour out in the forest observing. For her first four months in Gombe, Jane would have supper with her mom, but afterwards she'd go out again with her flashlight. She found a peak and made it her lookout.

Jane quickly realized that to make the most of her time in the field, she would have to be out in the forest every day and write up her notes into more formal observational accounts every evening.

Jane's biggest problem was that chimps are very conservative. They had never seen anything like Jane before. A white ape? The chimps would take one look at her and disappear into the vegetation. As the days turned to weeks and the weeks turned to months, Jane became worried. She knew if she didn't see something exciting before the money ran out, that would be the end of the study. She didn't want to let Dr. Leakey down because he had risked so much of his reputation by sending Jane, who didn't yet have a college education, into the field.

Jane would return from the forest distraught. She could not get close to the chimps. She thought she would not have enough time to gain the chimps' confidence. Her mother boosted Jane's morale by pointing out all the good things she had done or observed. She reminded Jane that she had found that peak from which to watch the chimps, and told Jane that through her binoculars she was

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THE BREAKTHROUGH

learning more than she realized. She learned the different calls that chimps make and discerned the kinds of food they eat.

Jane's mother encouraged her by pointing out that she had discovered that the chimps sometimes wander around alone or in small family groups. Jane had found out that at night the chimps climb into the trees and bend over the branches to make a woven platform or nest to sleep in. Jane appreciated her mother's support and just two weeks after her mother had returned to England, Jane made her first breakthrough observation.

One cold, rainy day in the forests of Gombe, Jane saw a chimp hunched over a termite mound through her binoculars. She recognized this as the one chimp who'd started to lose his fear of her before the others. This particular chimp had a beautiful white beard. Jane had already named him David Greybeard.

Jane saw David Greybeard reach out, pick a stem of grass, push it down into the termite mound, leave it there for a moment, and then pull it out. He then picked off the termites that were clinging on with their mandibles. He repeated the process several times. Jane then watched David Greybeard break off a leafy twig, removing the leaves in order to make the device he used to catch termites.

The chimp was making and using tools, Jane deduced. This was an amazing discovery because at the time, it was believed that only humans used and made tools. Jane couldn't believe her eyes, but she didn't send a telegram to Dr. Leaky until she saw David Greybeard fishing for termites a second time—just to be sure.

This observation of Jane's enabled Dr. Leakey to approach the National Geographic Society. They agreed not only to provide funds so that Jane could continue studying chimps in Gombe, but in addition they sent out a cameraman and photographer, Hugo van Lawick. Hugo became Dr. Jane's first husband, and still images from his film of Jane and her work appeared in *National Geographic* magazine articles. This was what took the story of Jane and the chimpanzees into the living rooms of people, first in America and then around the world.
When people ask Jane about special moments she experienced in

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THE BREAKTHROUGH

Gombe, she thinks of David Greybeard. He was the first chimpanzee who allowed Jane to follow him through the forest. Following David Greybeard gave Jane a whole new insight into how chimpanzees travel. She learned that if there is desirable food nearby, a chimp will sometimes climb a tree to taste it. Chimps even feel a fruit to see if it is ripe like we do at the grocery store.

Once when Jane was following David Greybeard, he branched off and went through a tangle of vegetation. For him it was easy, but Jane got caught in thorns. She thought she had lost David and would have to find him another day, but when she emerged from the tangle, he was sitting and looking back at Jane. It looked just as if he was waiting for her. She approached him and sat near him. On the ground between them was a ripe, red palm nut, which Jane knew chimps love.

She picked it up and held it towards David, but he turned his face away. He didn't want the palm nut. Jane carefully pushed her hand closer, and then David Greybeard turned. He looked directly into Jane's eyes, reached out, took the nut, and dropped it. He didn't want it, but he very gently squeezed Jane's fingers, which is how chimpanzees reassure each other.

In that one moment it was as though Jane and David Greybeard communicated in a way that predates human language. He understood clearly that Jane's motive was good, and Jane understood that he comprehended her offer but didn't want the nut. This moment was the first time Jane really felt that she was accepted, that this peculiar white ape was now no longer a threat. The chimps understood that they could communicate with Jane in their language.

3.

THE BREAKTHROUGH

LEARN MORE

- One of the most important discoveries Jane made was that chimpanzees make and use tools. She learned this while observing David Greybeard—the first chimp that made contact with her in Gombe—modifying a stem and then using it to pick termites out of small holes in a mound and then eating them. But chimps aren't the only tool users. Listen to this National Public Radio podcast in which scientists explain how polar bears, dolphins, spiders, elephants, orangutans, and crows use tools.

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4.

CHIMPANZEE BEHAVIOR PART ONE

"I think it's something we can learn from chimps—the way that after a fight they really, really work hard to resolve the conflict and reestablish harmony in the community."
—Jane Goodall

SUBCHAPTERS

- Tool Usage
- Play
- Reassurance
- Grief

CHAPTER REVIEW

Thanks to David Greybeard, Dr. Jane got to know the other chimpanzees of the community. When approached a group of chimps who were frightened of her, all would run away except for David. The other chimpanzees would look from David to Dr. Jane and back again. After a while, they realized that Dr. Jane wasn't as dangerous as they had thought.

Dr. Jane gradually began to piece together the complex chimpanzee society. She started to recognize the different individuals, and she named them. She realized that there is always one male who makes it to the top. This chimp is known as the alpha male. Dr. Jane began to know the females, too. She saw that they were traveling around with offspring of different ages.

After she noticed David Greybeard using a stem to extract termites from their mound, Dr. Jane began to observe other tools chimps used. For example, Gombe chimpanzees use leaves as sponges to soak up water to drink. They use rocks as weapons and as hard surfaces on which to crack open gourds in order to eat the fruit inside.

Chimps most often use objects as tools to get food, but they will also use them as toys. Jane has witnessed chimpanzees playing tug-of-war and throwing gourds in the air and catching them like balls. Chimps' imaginative use of objects is an indication of their intelligence.

There are two types of play for chimpanzees: social play and lone play. There is much social play between chimpanzees. Dr. Jane likes to watch mothers and young ones play together. Young chimps also get together to play. There is no birth season among chimpanzees, meaning that unlike other animals, chimps do not all have babies at the same time of year.

4.

CHIMPANZEE BEHAVIOR PART ONE

Therefore, young chimps are all different ages. A single family can sometimes have an almost fully mature individual, an adolescent, a juvenile, and an infant who all play together. Some of the older chimps will be very gentle when they play with the young ones, but others are less gentle.

When a chimp plays by himself or herself, it is known as lone play. This might happen because a mother chimp is not in the mood to play with her baby. Dr. Jane says lone play is where you see inventiveness. Young chimps try out new things when engaging in lone play.

Dr. Jane has also observed reassurance behavior in chimpanzees. An example of reassurance behavior occurs when male chimps show submission to the alpha male by panting, grunting, or bowing to him. Sometimes the alpha male will then reassure the other male chimps by patting them on the back.

If there has been a fight, the victim, although very scared, will approach the victor and bow, crouch, or even beg for reassurance. After this exchange of reassurance behavior, things go back to the way they were. Dr. Jane believes reconciliation is something we can learn from chimps. After a fight, chimps work hard to resolve the conflict and reestablish harmony in the in the community. We should try to do this ourselves.

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CHIMPANZEE BEHAVIOR PART TWO

"Just as chimpanzees have a dark side, so, like us, do they have a gentle, compassionate and true altruistic side."
—Jane Goodall

SUBCHAPTERS

- Hunting
- Aggression
- Compassion

DID YOU KNOW?

Although chimps eat meat, it only makes up 5%-8% of their diet.

CHAPTER REVIEW

Dr. Jane was shocked when she saw a chimpanzee eating meat. Before she arrived in Africa, scientists believed that chimps were just herbivores. Dr. Jane was excited the first time she saw chimps hunt. The chimpanzees at Gombe mostly hunt other young monkeys. Their main prey in Gombe is the colobus monkey, but they have been known to eat other animals such as pigs.

Dr. Jane was surprised to discover that, like humans, chimpanzees have a dark side. Through years of observing chimps, she learned that they are capable of extreme violence and brutality, even a kind of primitive war.

In a community of about 50 chimps, there are usually between six and 10 males. These males will go out in groups of three or more and patrol the edges of their community. They go to the edge of a neighboring social group of chimps. The group of males looks for neighbors whose presence they see as a threat. If they see a stranger, they will chase and attack him or her. The victim is gravely injured and usually dies from his or her wounds. However, if the group of male chimps sees another group about the same size as their own or bigger, then very quietly and silently they will retreat.

If there is a fight going on, a young male may creep up and watch. Young males in many primate species are attracted by this sort of aggression. Dr. Jane thinks this fact might say something about human aggression.

Just as chimpanzees have a dark side, they also have a gentle, compassionate, and altruistic side like humans. Dr. Jane gives an example of this kindness. Once, a chimpanzee mother died, leaving her three and a half year old infant behind. At this age, the child is just beginning to be able to survive without its mother's milk and on the kind of foods it has learned are edible. Orphaned males who have older siblings would be adopted by his sibling, as this is standard practice in chimp families. But this orphaned chimp had no sibling. Much to Jane's wonder, the little three and a half year old male was adopted by a

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CHIMPANZEE BEHAVIOR PART TWO

12 year old adolescent male. (In human years, that's about a 15 or 16 year old.) The teenager's name was Spindle, and he waited for the little male during the group's travel.
Spindle allowed the young chimp to ride on his back and even cling underneath him like a small infant if it was cold or he was frightened. These are all things the infant's mother would have done.

When Spindle made his night nest, the little chimp would climb up the tree and whimper to be let in. Spindle would reach out and draw him close. Spindle would also do a mother's job of keeping her child away when the adult males are vying for dominance. When adult chimps compete to show off, they perform dramatic displays. They hurtle across the ground and throw rocks, stamping with their feet and slapping with their hands. A mother chimp has to protect her infant because it may be picked up and thrown.

Dr. Jane was amazed that Spindle was doing this for the baby chimp because adolescent males normally keep away when males are aggressive. Sometimes a low-ranking male who has been attacked by a higher-ranking male is looking around for somebody to vent his anger on, and adolescent males are the perfect outlet. Spindle was attacked many times when he ran in to rescue the little one he had adopted, who hadn't yet learned to keep out of the way.

LEARN MORE

- Click here to find out about the unique stomachs of colobus monkeys, how large their groups are, how much they weigh, how long they live, and the problems they face because of habitat loss.

5.

CHIMPANZEE BEHAVIOR PART TWO

LEARN MORE CONT'D

- Dr. Jane saw an amazing example of an alpha male adopting a motherless infant in the Disneynature film, *Chimpanzee*. Watching that relationship develop is one of the most moving things Dr. Jane has ever seen. Watch *Chimpanzee*. Keep an eye out for the part that Dr. Jane loves!

5.

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6.

CHIMPANZEE DEVELOPMENT & LEARNING

"I discovered that the bonds between family members are very strong and very long-lasting."
—Jane Goodall

SUBCHAPTERS

- Family & Parenting
- Observational Learning
- Developing Cultural Behaviors

CHAPTER REVIEW

Dr. Jane discovered that the bonds between chimp family members are very strong and long-lasting. In the wild, a chimpanzee can live to be as many as 50 years old. In captivity, they may live longer. A mother chimp has her first child when she's about 12 or 13. She then only has one child every five years on average. When the next baby is born, the older child who is five or six doesn't immediately leave and become independent. The older child is still emotionally dependent on the mother and travels with her and the younger brother or sister. The bonds between mother and offspring become stronger, and bonds develop between brothers and sisters. These bonds can last throughout life.

Dr. Jane learned from watching chimp families that a good mother is affectionate. She is protective, but not overprotective. She is also playful. When Dr. Jane observed chimp mothers enjoying their infants, she vowed that when she had a baby, she would have fun as much fun with her own child as the chimps had with theirs.

Dr. Jane saw that the most important thing a chimp mother had to be was supportive, just like her own mother who told her to follow her dreams of studying animals in Africa. Male chimps with supportive mothers are more likely to rise higher in the dominance hierarchy because they feel secure in themselve Chimps have a long childhood period, much longer than most mammals. This is true of humans too.

Dr. Jane was fascinated with infant development and family relations. One family in particular was interesting to watch. Flo, the matriarch, had an adult son named Fabin and another son, Figin, who became top-ranking male. Figin was probably the most intelligent male Gombe's ever had. He reigned for 10 whole years. Flo's daughter Fifi also became an excellent mother.

At the time when Dr. Jane was learning about them, baby Flint was the youngest of Flo's offspring. From the beginning, Fifi was absolutely fascinated by new baby Flint, and she watched

everything her mother did to take care of him. Flo carried little infant Flint and he would cling to her chest.

Dr. Jane had brought a stuffed chimpanzee toy with her to Africa that she kept in her tent. Fifi came and took this toy. She started carrying the toy around just like Flo was carrying little Flint, pressing the toy chimp to her chest. Dr. Jane was surprised to see this.

About 10 days later, Dr. Jane saw Flo put Flint onto her back. To Dr. Jane's amazement, she then saw Fifi take the toy chimp and immediately put it onto her back. This was a perfect example of observational learning. Young chimps watch what their mothers do and start to understand some of these caregiving techniques.

Dr. Jane noticed that females are generally better at modeling their mothers' behavior. Females learn more quickly, whereas males are always looking around, worried about showing their dominance, even at a young age. The young male chimps are more outgoing, while the female children are more likely to be content to stay near mom and watch her. This is why they get good at taking care of little ones earlier than most males. However, this is not always true, and there are always exceptions to this rule.

Sometimes siblings can be even more perceptive than mothers. For example, Dr. Jane once saw a mother chimp named Melissa traveling through the forest of Gombe with her two children, an adolescent named Gremlin and an infant named Galahad. Gremlin was following her mother and Galahad was following Gremlin.

Suddenly Gremlin turned back and grabbed hold of the infant who wanted to follow his mother. Gremlin wouldn't let Galahad go. Gremlin realized that her mother had gone past an area where ticks had hatched. There were hundreds of tiny ticks, and Gremlin noticed that her mother was covered in them, so she pulled her baby brother out of the way. When you put all these observations together, you get a good idea of how chimpanzees are thinking. This gives us insight into their minds.

6.

CHIMPANZEE DEVELOPMENT & LEARNING

Behavior varies across Africa. At different field study sites, there are completely different tool using behaviors. In Central and West Africa, chimps use rocks to crack open hard shell nuts, and sometimes the very same nuts in Gombe aren't eaten by the chimps there at all. These kinds of differences are cultural. Young chimps learn cultural preferences from the adults in the community.

Eventually, though, a new tool use or feeding preference occurs, and it is always the young ones who start it because they are the ones who experiment. After observing this behavior, Dr. Jane began to believe that chimps have a primitive culture because their interactions and learning processes were akin to those of human culture in which behavior is passed from one generation to the next through observational learning. She was attacked by scientists when she first came out with this idea because she had not been in the field very long, but now her theory is widely accepted.

ACTIVITIES

- Watch this video to learn more about chimpanzee culture and see different tool use in action.

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7.

ANIMAL INTELLIGENCE

"The animal kingdom, of which we are a part, is filled with secrets and I'd love to be young and learning about these things now. Because all the doors are wide open and you never know what you're going to find."
—Jane Goodall

SUBCHAPTERS

- Chimpanzees
- Birds
- N'kisi the Parrot
- The Octopus
- Bees
- Trees & Plants

CHAPTER REVIEW

The chimpanzee mind is capable of a lot. Chimps can be taught the signs of American Sign Language, which is used by people who have a hearing impairment. They can learn 400 or more signs. Some chimpanzees in captivity like to paint. Those who paint and have learned sign language are able to tell you what they've painted. One very famous chimpanzee in Japan named Ai even learned to play memory games on the computer.

Birds are also quite intelligent. Scientists at Oxford University in England gave two New Caledonian crows a very simple task. They were supposed to get a piece of food from the bottom of a glass tube using a metal hook, but the hook broke accidentally.

The crows were frustrated until they learned to use their claws and beaks to bend the hook, allowing them to obtain the piece of food. Skeptical scientists said, "Well, that was just chance. It was luck." Dr. Jane, however, wasn't so sure, especially when the next day the birds were given straight wire and again made a hook for themselves. This started a whole flurry of interest in avian intelligence.

Another smart bird Dr. Jane met was an African grey parrot named N'Kisi. When N'Kisi saw her, he said "You're Jane," and later he asked, "Got a chimp?" N'Kisi lived in the same home as an iguana, and when then iguana died, N'Kisi—thinking about how his electronic toys worked—suggested putting a new battery in the iguana.

Octopuses are very wise about protecting themselves. They have soft bodies, so they like to hang out where there are rocks in which they can hide. Dr. Jane has seen footage of an octopus going out into the middle of an open space and carrying coconut shells with his tentacles, and hiding beneath them in case a predator came by.

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ANIMAL INTELLIGENCE

Bees are also adept at learning new things. Bumblebees have been taught to roll a little ball backwards into a hole. As soon as this ball gets into the hole, the bumblebee is given a drop of nectar as a reward. The really astonishing thing, though, is that other bumblebees who have merely watched a taught bumblebee can do the same without being trained. They learn just by watching. This ability is supposed to be a mark of superior intelligence.

Dr. Jane believes that we humans have been far too arrogant about our own intelligence as compared to other animals. The animal kingdom, of which we are a part, is filled with secrets and new things to discover. The doors are wide open, and you never know what you're going to find. The kingdom of plants is another open field that we have so much more to learn about.

LEARN MORE

- Watch Ai play memory games on the computer while her son Ayumu watches and learns. Click here!
- Click here to watch a crow use tools and surprise scientists.

7.
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8.

CHIMPS & HUMANS PART ONE

"Science has gradually opened its mind to thinking out-of-the-box, the original box that had this sharp line dividing us from the rest of the animal kingdom."
—Jane Goodall

SUBCHAPTERS

- Personalities & Emotions
- Medicine
- Adaptability

CHAPTER REVIEW

If you want to study animal science, Dr. Jane believes that today is the most exciting time to do so because there are so many things, including animal intelligence, that were not believed to exist when she was a student. Personality and emotions of animals were also not valued when Dr. Jane was beginning as a scientist. Gradually, science has opened its mind, and the sharp line dividing us from the rest of the animal kingdom is slackening. Scientists now largely believe that chimpanzees have something like a mind, something like conscious thought.

One of the first things that was very exciting for Dr. Jane was seeing how much of chimpanzees' behavior resembled our own. For example, two chimpanzees greeting one another after they are separated during travel will kiss, embrace, hold hands, or pat each other when they are reunited. These are things that we humans do in the same context.

Dr. Jane also quickly learned that not only do chimps have different personalities—they also all look and sound different from each other. Each chimp has his or her own pant-hoot, a distance or greeting call. Pant-hoots are important for the scattered members of a community because they can find and identify their friends and family by listening for their calls. Chimpanzees also have the same kind of emotions as we do like happiness, sadness, and fear. Chimps even have a sense of humor!

Chimps use plants as medicine. When they have parasites, they will swallow certain leaves with a bristly surface that catches the pests and their eggs. Often times chimps use the same plants for medicinal purposes that the local people use. Young chimps observe their mothers and older chimps who use these plants and then use them themselves.

8.

CHIMPS & HUMANS PART ONE

Chimps are capable of adapting to different environments. In Uganda, where Dr. Jane and her team are studying chimpanzees, chimps are losing their habitat along the Albertine Rift to human population. The chimps in Uganda have learned to raid the humans' sugarcane crops. They make these raids at night because it is safer. Later you'll learn how their dwindling forest habitat has brought these farms closer and closer and how these pressures encourage this kind of behavior.

The Jane Goodall Institute of Spain has a project in Senegal. The climate there is so torrid there that the chimpanzees are foraging at night, an example of their adaptability.

In Mali, the weather is even more extreme. There are limestone cliffs containing caves, and it seems from preliminary observations that chimpanzees are spending time in the caves because it's cooler there.

We are discovering that chimpanzees are more adaptable than anybody used to think. They're not just confined to the rainforest. Dr. Jane thinks this discovery presents another way of thinking about human evolution and how we've been successful because of our adaptability.

8.

NOTES

9.

CHIMPS & HUMANS PART TWO

"...Many scientists will discredit that. But you have to be there. You have to see it. You have to feel it to understand really what I'm talking about."
—Jane Goodall

SUBCHAPTERS

- Spirituality
- Anthropomorphizing Chimps
- Empathy in Science

CHAPTER REVIEW

Durring her studies at Cambridge University, she was told that only humans had personalities and emotions. Professors told her that only humans could use and make tools. She knew that this was not true. People also said that only humans had some kind of spirituality, but Dr. Jane didn't think so.

Dr. Jane had witnessed two ways in which chimpanzees show spiritual behavior which don't seem to be related to any special purpose. If a heavy, violent rain starts suddenly, male chimpanzees will do a spectacular display. Standing upright, they'll drag branches and make a deep grunting sound that may last for about five minutes as the rain comes pouring down. No one knows why the chimps do this. It might just be because they're angry and dislike rain, but Dr. Jane feels their actions might be a spiritual response to unexpected shifts of the earth.

Another way chimps display spiritual behavior occurs around the base of a waterfall. Following a group of mostly male chimpanzees, Dr. Jane saw that as they got closer to the waterfall, their hair started rising. When they arrived at the waterfall, they went into the stream which normally they avoid.

At the shallow base of the waterfall, they began a rhythmic display that was very different from a dominance challenge. The male chimps swayed from foot to foot, grabbing vines. Some picked up big rocks in the stream bed and hauled them forward. Some climbed up the vines at the side of the waterfall and pushed out into the spray.

At the end of the display, Dr. Jane was watching from just the right place to see a male chimp sitting on a rock close to the waterfall. His eyes looked up at where the water was coming down and he watched it flow away. She felt that these chimps had developed a special way of communicating about the water, which is forever coming and going.

9.

CHIMPS & HUMANS PART TWO

Dr. Jane thought that if the chimps were able to discuss it with each other, they might start questioning the water. Their hypothetical discussion, she figured, might lead to an early animistic religion such as the worship of the sun or the stars. These natural elements of earth were inexplicable to early humans, and Dr. Jane felt that the chimps were attempting to make sense of them too.

Many of her professors told Dr. Jane that she had done everything wrong. They maintained that she should have assigned the chimps numbers, not given them names. They said she couldn't talk about chimpanzees as having personalities or minds and thoughts because these things were unique to humans.
She certainly couldn't talk about them having emotions. That was the height of anthropomorphism.

At the time, Dr. Jane's professors didn't know about the similarities of biology between us and our closest relatives. We now know the structure of the DNA of humans and chimpanzees differs by only just over 1%. The composition of the blood and the immune system are almost the same. The anatomy of the brain is also very similar.

Dr. Jane might have capitulated to her professors, but she remembered her first wonderful teacher—her mother. Dr. Jane's mother had taught her to follow her dreams and believe in herself. For all their knowledge about animals, Dr. Jane knew the professors were wrong. She knew animals had personalities and emotions because she had seen them in her childhood dog, Rusty.

In science, one is supposed to be very objective, but Dr. Jane thinks it is nonsense that to be a good scientist you must not have your emotions involved. In fact, she believes emotions are important in a scientist, and so is intuition because it gives you an idea. Once you've got that idea, then you can decide to prove or disprove it in a scientific way.

9.
NOTES



10.

HUMANS & THE ENVIRONMENT PART ONE

"I knew I had to try to do something for these chimpanzees who had already given me so much."
—Jane Goodall

SUBCHAPTERS

- Becoming an Activist
- Learning About Problems Faced by Humans
- Human Intellect
- Materialism

CHAPTER REVIEW

In this chapter, Dr. Jane tells you about the moment when she changed from scientist to activist. The year was 1986, and Dr. Jane had published a book called *Chimpanzees of Gombe: Patterns of Behavior.* The head of the Chicago Academy of Sciences told Dr. Jane that her book warranted a conference, so they held one.

At the conference, scientists talked about different aspects of chimp behavior in different areas and their various habitats and cultures. There was one session on conservation, however, that opened Dr. Jane's eyes. What she learned in the conservation lectures was appalling. Scientists showed slides and movies of the destruction of forest habitats. They had data that showed declining chimpanzee numbers. They discussed another problem, the bushmeat trade, which is the commercial hunting of wild animals for food. Chimp mothers were shot so that their babies could be stolen to sell for entertainment, to circuses and zoos for medical research.

At the same conference there was also a session about the living conditions of captive chimps. Dr. Jane learned about the very cruel training of chimps used in entertainment. She watched secretly filmed footage of chimpanzees in medical research laboratories. The bare cages surrounded by bars in which the chimps were kept were only five feet by five feet. After seeing these images, Dr. Jane couldn't sleep for nights. She didn't know it yet, but she would leave that conference an activist.

In addition to learning about the atrocities chimps faced, Dr. Jane was also discovering the problems faced by humans living near chimp habitats. These people were challenged by poverty, hunger, a lack of education and health care, competition for diminishing resources, and a population growth that was threatening their existence. That's when it hit Dr. Jane: How can we, she pondered, even try to save these chimpanzees while people living around the borders of their forest are also in a terrible situation?

10.

HUMANS & THE ENVIRONMENT PART ONE

Dr. Jane asked herself how it was possible that we humans, the most intellectual creatures that have ever walked on Earth, were destroying our only home. She saw a disconnect between the clever mind and the human heart. Instead of making major decisions based on how our actions will affect future generations, we make decisions depending on how they affect us right now. Dr. Jane realized that we have become caught up in a materialistic and greedy world, and that this has dire consequences for the future. We are so interested in money and personal gain that we are neglecting important things like clean air, clean water, and a healthy environment. She resolved to do something about it before it was too late.

10.

NOTES

11.

HUMANS & THE ENVIRONMENT PART TWO

“There are places, animals, environments, habitats that used to be flourishing and green and now they’re dry and desert-like because the water has been drained for agriculture. [People and] animals are certainly suffering.”
—Jane Goodall

SUBCHAPTERS

- Exploitation of Natural Resources
- Three Interrelated Problems

CHAPTER REVIEW

Throughout human history, wealthy nations have taken over parts of the land to use its natural resources, but they haven’t done so responsibly. People have bought up the natural world and its water, privatizing it so that ordinary people have to pay for things that should be free for everyone. Some people cannot afford to pay for these resources, so the gap between the wealthy and the poor widens.

Dr. Jane likes to visit the state of Nebraska to see the annual migration of sandhill cranes, but when she flies over the land, she is hurt by what she sees. From the plane, she gazes at machinery that drills deep down into the aquifer, taking water in order to irrigate land that isn’t suitable for the crops being grown there, like corn. Dr. Jane sees this as stealing water; the environment which was once abundant and flourishing is now dried up.

The water has been drained for agriculture so that a handful of people can become wealthy, but what these people don’t realize—or perhaps do not care to realize—is that they are causing people and animals to suffer by depleting the environment of water. While Dr. Jane is hopeful when she sees that there are still hundreds of thousands of sandhill cranes in Nebraska, building up resources for their long migrations to the far north, she is still concerned about the problems that our planet faces.

There are three main problems Dr. Jane identifies that we need to solve to ensure a sustainable future. They are:

1. Extreme poverty: People who are extremely poor do what they must to survive. Those in poverty cannot be concerned about whether a food product or piece of clothing was made ethically. They cannot seek alternatives that are more sustainable and made in ways that don’t harm the planet. They are only able to buy the cheapest foods and other goods.

11.

HUMANS & THE ENVIRONMENT PART TWO

2. Unsustainable lifestyles: Many of us have far more than we need and end up wasting needlessly. Our waste ends up in landfills, and we pollute the environment with this trash. Dr. Jane knows that if we paid more for our food, we would think more about wasting it.
3. Human population growth: We cannot continue to grow in size as a human population given the rate at which we are using the planet's finite resources. There will be too many people and not enough food and water.

Dr. Jane knows that sometimes it feels as though these problems are insurmountable, but if we give up, we lose hope about the future. We must think about the world we want to pass on to our children, grandchildren, and great-grandchildren.

LEARN MORE

- Do you have extra food, clothes, or toys that other people could use? Do some research and find out where to donate these items. Fewer things have to be produced when we make an effort to reuse existing objects.

ACTIVITIES

- Growing crops that are suitable to a landscape is important for keeping the land healthy and fertile. Find out what native plants should be grown where you live. Make a list and identify these plants in your own backyard or neighborhood. If you don't see native plants, what's there instead? Why would it be better to replace these outside species with native plants? Click here to learn about native plants in the United States.

11.

NOTES



12.

THREATS TO ANIMALS

CHAPTER REVIEW

"When you go to a circus and see a chimpanzee performing or when you look at an advertisement and you see a chimpanzee dressed up you may smile and say, 'How cute. Aren't they like people?' But you have to realize that this is part of a major, major problem."
—Jane Goodall

SUBCHAPTERS

- A System of Exploitation
- Conflicts with Farmers
- Fishing
- Animal Trade

Conserving chimpanzees in the wild is not a simple problem. There are multiple problems that differ from place to place, and they are all interconnected. These multiple problems include human population growth, the diseases that humans give to chimps as they move deeper into the forest, and the cattle that people consume.

Forests are cut down in order to grow grain to feed cattle, and herders move the cows deeper and deeper into the forest. The cows then start eating young plants and this eventually kills the forests. The old growth forest turns to woodland, which leads to desertification, soil erosion, and death of the environment.

There are mutual problems that humans and animals face. For example, as elephants lose their habitats, they also lose their food, of which they need copious amounts. Seeking nourishment, they might eat an entire crop of corn and destroy a farmer's livelihood in one night. Chimpanzees are capable of this as well. It's not surprising the farmers dislike these animals and wish they were gone when they eat all of their crops, but the animals are often forced to do so.

These problems are not confined to the forest—they happen in cities too. In Asia, troops of rhesus monkeys move into towns and take people's food. Dr. Jane contends that we must use our intellect to try and find ways to mitigate these human-animal conflicts.

Another human-animal conflict deals with fishing. Many people, particularly those who live on islands, depend on fish as a source of protein. Fishing has sustained humanity for thousands of years, but commercialized fishing is threatening the planet and its aquatic life. Commercial fishing is often not sustainable; many of the fish caught are killed needlessly, and smaller nets catch young fish who are not yet big enough to reproduce. In oceans and in rivers, overfishing is leading to a dismal future for people who rely on fish as a source of nutrients.

12.

THREATS TO ANIMALS

Another form of hunting-subsistence hunting-enabled people living in and around the forest to kill only enough animals to keep themselves alive and to allow the animals to sustain themselves. Responsible subsistence hunters would never intentionally shoot a mother chimp with a baby because that would mean killing the future. Once this hunting became commercialized, though, hunters were out to get everything. To these greedy and careless hunters, a mother with a baby would be a double success. They could sell the mother as bushmeat and the baby for entertainment, to zoos, or to medical research labs. This kind of reckless hunting is a lucrative trade, albeit an illegal one.

There is hope, however. Last year, for example, the United Arab Emirates—an area where wild animals have increasingly been exploited as pets—banned the keeping of wild animals as pets by private citizens. Dr. Jane sees this a huge step in the right direction.

LEARN MORE

- Read about the steps you can take to alleviate the struggles of abused or abandoned animals.

12.

NOTES



13.

ANIMAL CRUELTY

CHAPTER REVIEW

"The more we learn about the animals' intellect and their sentience, the more we have to think as responsible beings on this planet how we treat the other beings with whom we share or should share this planet."
—Jane Goodall

SUBCHAPTERS

- Medical Research
- Developing an Alternative
- Zoos
- A Different Perspective

Dr. Jane will never forget the first time she saw secretly filmed video footage of cruelty to chimpanzees in medical research laboratories. Ostensibly, the logic behind using chimps for medical research made sense: they are biologically similar to us, so we can infect them with diseases which other animals cannot be infected with because they're less like us. Chimps seemed like the perfect animals on which to test out vaccines and cures.

The problem, though, is that these same scientists are sometimes not prepared to admit the equally striking similarities of psychology, behavior, and emotion between us and sentient chimpanzees. For Dr. Jane, this is heartbreaking. Seeing depressed chimps confined by themselves, separated from their mothers, pains Dr. Jane.

Many scientists have realized that experiments conducted on chimpanzees that don't lead to progress in human health should be stopped. Many of these chimps are released into sanctuaries, but there is still a long way to go. There are still chimpanzees and other animals in inappropriate conditions. However, there is hope as more evidence comes out that shows experiments on animals, especially ones with animals who are stressed and therefore have compromised immune systems, don't provide the answers humans need. There are also new things like tissue culture and cell culture that can provide much more accurate ways of finding out about human health, cures, and vaccines. Dr. Jane thinks we should focus our energy on these alternatives.

Dr. Jane emphasizes that regardless of the kind of animal, we must consider the ethical and moral implications of how we treat the creatures we use for testing. She also sees problems with the way we treat animals in zoos. So many of them are bored and don't get the amount of space they need. We must work to make sure zoo animals lead happy and healthy lives. We need to try to understand what goes on in the minds of all sorts of animals and think about them as not just things, but as living, breathing, feeling beings.

13.

ANIMAL CRUELTY

LEARN MORE

- There are bad sanctuaries and good sanctuaries, just as there are bad zoos and good zoos. Click here to find animal sanctuaries near you and plan a visit.
- Research organizations who are working on animal protection efforts and see how you can get involved. Review a list like this one to see if there are organizations that offer opportunities that fit your interests.

13.

NOTES

14.

CLIMATE CHANGE

"It's only when we learn to operate with head and heart in harmony that we can achieve our true human potential. "
—Jane Goodall

SUBCHAPTERS

- Methane & The Meat Industry
- A Growing Awareness

CHAPTER REVIEW

There is so much waste that we have put into the world: pollution, the reckless burning of fossil fuel, agricultural, industrial, and household waste. Earth's land, air, and water are being contaminated. The rainforests are being destroyed, and the oceans are becoming acidic.

As oceans become less capable of absorbing carbon dioxide—CO_2—from the atmosphere, and as rainforests with their capacity for absorbing and holding CO_2 disappear, a blanket of greenhouse gases forms and surrounds the globe, trapping the heat of the sun. This causes the gradual heating of the Earth's surface, its oceans, and the melting of its ice. Dr. Jane has met people who live on small islands around the world who have been forced from their homes because water levels have risen due to the melting of polar ice caps.

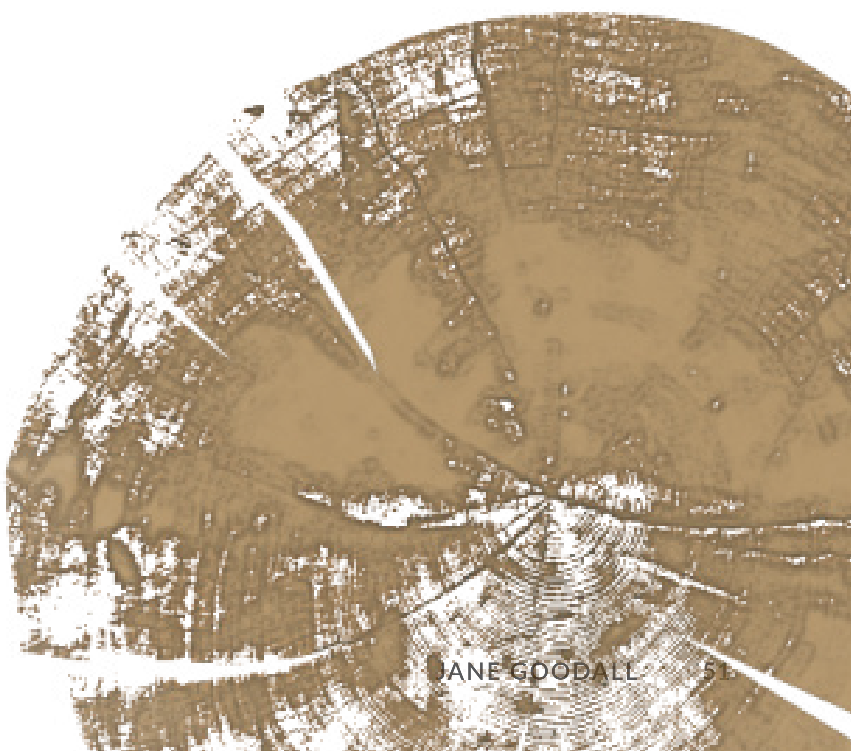
Carbon dioxide is the main greenhouse gas, but there is another gas which is even more potent: methane. One of the main ways methane is produced is through industrial farming of animals. To produce enough meat for people to eat, billions of cattle, pigs, turkeys, and chickens are raised on intensive farms. These animals need to be fed, so forests are cut down to grow grain that they will consume. Then, huge amounts of fossil fuel are used to transport the grain to the animals, to transport the animals to slaughterhouses, to transport the meat to stores, and to transport the meat from the stores to people's homes. Dr. Jane hates the waste and cruelty involved in eating meat.

14.

CLIMATE CHANGE

ACTIVITIES

- A carbon footprint measures in tons per year how much CO_2 a person's lifestyle releases into the atmosphere. The size of your house and whether you use public transportation all influence how big your carbon footprint is. Find out how much CO_2 your everyday actions put in the atmosphere. Is your carbon footprint above average, or below average? Can you think of any ways to reduce this number?



14.

NOTES



15.

WATER

"[Water is] such a precious resource. And it's disappearing and getting increasingly polluted."
—Jane Goodall

SUBCHAPTERS

- Fresh Water
- The Ocean
- Ocean Warming
- Water Conservation

DID YOU KNOW?

The average person in the United States uses 80-100 gallons of water per day!

CHAPTER REVIEW

One of the most pressing threats that we face in the future is shortage of fresh water supplies. We can live without oil and gas because we know their alternatives, but we cannot live without water. So why are so many people taking water for granted?

Why do we divert huge amounts of water from underground aquifers to irrigate crops which should not be there in the first place because the water supply isn't sufficient? Why do we purchase bottled water? Why do we waste water to make ice just to keep our drinks cool?

Think about all the other ways water is wasted. Restaurants give out water without asking customers if they would like it. This water is often not even drunk, or just a sip is taken. The whole rest of the glass ends up down the drain, and the same goes for refills. Do you ever run the water while you're bushing your teeth? How about watering your backyard to make it look nice? These actions all waste water.

Dr. Jane urges us to value water. Thinking about its importance leads us to contemplate the ocean into which streams and rivers drain. When industrial, agricultural, and household waste is dumped into these smaller veins of water, the toxins and chemicals end up in the ocean. They are all connected. Plastic is washed into the ocean and aquatic animals eat it. This kills them. Plastic in the ocean will not disintegrate for 2,000 years, and as it does disintegrate, it turns into minute particles. These particles are still there even when the plastic seems to be gone. Worst of all, these tiny bits of plastic are toxic.

Imagine Earth as a human with a chest. If you were to take an X-ray of the Earth's chest, inside you would see its lungs and its heart. What would its lungs look like? Forests and oceans. Both of these ecosystems absorb carbon dioxide from the atmosphere and store it, producing a better quality of air for you to breathe. What would Earth's heart look like? The great coral reefs. In addition to polluting the oceans, global warming is causing ocean waters to heat, and this is how coral reefs are destroyed. Coral reefs contain a myriad of biodiversity.

15.

WATER

What can we do to stop this? First of all, we need to understand that what we do makes a difference. Dr. Jane says we must have in our own personal habits the idea that we need to conserve precious water. She knows many people who collect rainwater off their roofs which they put in barrels and later use to water their gardens. People are also beginning to realize that it is better to plant indigenous species in their gardens and yards because they require less watering. Our showers are too long, and we flush the toilet after just a little pee. Dr. Jane finds it shocking that we waste all that water in order to have a pee. Think about water whenever you are using it.

LEARN MORE

- Read the Jane Goodall Institute of Canada's publication "Protecting our Sacred Water."

ACTIVITIES

- Toilets, showers, and baths are the largest consumers of fresh water. Find out how much water you use, and try and explain why your usage is above or below the average. Are there ways you can be more thoughtful about how much water you use? Here's an idea: place a large bucket next to the kitchen sink and dump water in the bucket instead of down the drain. How much water will you collect?

15.

NOTES

16.

LAND

"When I used to go out every day at Gombe and I was on my own, I would put my hand on a trunk and feel the sap rising, and feel this tree as a living being in its own right."
—Jane Goodall

SUBCHAPTERS

- Forests
- Palm Oil
- Resilience of Trees: Gombe National Park
- Marvels of the Plant Kingdom

CHAPTER REVIEW

Dr. Jane feels trees are living beings. She thinks this began with her love of trees as a child, which was amplified when she got to Gombe National Park and spent time in the forests. Her connection to trees is why she is so deeply hurt by the destruction of forests. As Earth loses forests, it also loses its great apes to extinction as their habitats disappear. Orangutans have been most affected.

Forests are being destroyed to grow plantations of oil nut palms. Oil nut palms produce palm oil, which is now in so many of our products. A lot of the food you eat probably contains palm oil. It's used to create biofuel, which is meant to be environmentally friendly but is actually the result of obliterating vast areas of primary and old growth forests. What can you do about the palm oil problem? Try to avoid products containing palm oil. Often times palm oil is not labeled, but do your best, and if it is in the list of ingredients, then please don't buy it unless it is certified to come from a sustainable plantation. We don't know that it's totally sustainable, but Dr. Jane is glad that it is at least one step in the right direction.

Dr. Jane finds it fascinating that more and more scientists are beginning to talk about the intelligence of trees and the communication that goes on between trees. Trees cannot speak like humans, of course, but here is an example of the kind of communication they are capable of: A certain kind of tree is attacked by caterpillars. That tree can then put out pheromones and this will warn other trees of the same species that there is a plague of caterpillars. As a result of that, the other trees are able to put extra toxins into their leaves which will help them to counteract the caterpillars when they arrive.

Trees are powerful. Their seeds are such a life-force that even after being dormant, they can grow in overused soil with time and a couple of rainy seasons. Trees can fight back if given the chance.

16.

LAND

LEARN MORE

- Read about how trees communicate with one another.
- Click here to watch an orangutan use American Sign Language (ASL) with a deaf girl to communicate an important message about palm oil.
- Go into your pantry and look at the lists of ingredients on all the food packages. Write down a list of the foods that use palm oil. Brainstorm together about what products you can buy to replace the ones that use palm oil. You can even download the Sustainable Palm Oil app to help you.

16.

NOTES



17.

INDUSTRIAL AGRICULTURE

"When I think of children in the future, it means that we have to try and do everything we can to fight industrial agriculture."
—Jane Goodall

SUBCHAPTERS

- Monocultures
- The Dangers of GMOs
- GMOs Have Far-Reaching Effects
- The Farmer's Battle

CHAPTER REVIEW

The growing of one, single crop on a huge area of land is a monoculture. These single crops are forced to produce two crops a year when normally they would only produce one. To accomplish this, more and more artificial chemical fertilizers are put into the soil, and this poisons the land. The chemicals then wash down into the streams and the rivers and eventually end up in the ocean, as you learned in chapter 15.

One of the big problems in agriculture today is that companies are trying to grow more food more cheaply. To keep up with growing human populations, companies plant monocultures of corn, wheat, and soy, and very quickly the land becomes infertile because these crops are being forced to grow. The more fertilizer used, the more infertile the soil becomes, prompting an endless cycle of artificial growth methods. The land continues to be poisoned, and now the crops are particularly susceptible to death because if a disease hits a monoculture, the whole crop may be lost.

Pests have gradually become resistant to the chemicals sprayed on plants, which produces super-bugs. Super-bugs can resist the toxin in the plant, and this means that even more pesticides have to be sprayed onto the crops, so the soil becomes even more poisonous. Our health becomes even more at risk, and bees, butterflies, and ladybugs die, but the companies who use these pesticides are always trying to refute the evidence that proves that they are dangerous.

Genetically modified organisms, GMOs, are plants that have been advertised as saving the world. We are told they provide enough food to feed growing human populations. However, these GMOs have been fed to a number of animals and have bad effects on the health of rats, rabbits, and pigs. This does not bode well for humans. It seems that we, too, can be negatively affected by genetically modified organisms.

17.

INDUSTRIAL AGRICULTURE

LEARN MORE

- Find out about threats to bee populations and the ways they impact humans. Plus, learn strategies to help save them.
- Join the discussion about Pollinators & Migratory Species on a Roots & Shoots Community Facebook page.
- Join the discussion about Industrial Agriculture on a Roots & Shoots Community Facebook page.

ACTIVITY

- Keep biodiversity alive! Click here to participate in an heirloom seed exchange.

17.

NOTES



18.

ORGANIC FARMING

"If [GMOs] and monocultures aren't the answer because of all the harm they're inflicting on the environment, what can we do? Well, what we can do is to move more and more in the direction of organic farming."
—Jane Goodall

SUBCHAPTERS

- Organic Farming: Wine
- Organic Farming: Coffee

DID YOU KNOW?

The United Nations has said that the way to feed the world in the future is not through industrial agriculture—it's through small-scale family farming. The UN, after long investigation, has determined that genetically modified food has not increased yield.

In 2015, the U.S. Department of Agriculture announced there are 19,474 organic farms in the United States.

CHAPTER REVIEW

Switching to organic farming will help cut back on the problems of GMOs. Organic produce can cost a little more, but Dr. Jane feels that if you pay more for your food, you will respect it more and waste it less. If we make an effort to only grow and buy organic food that is produced in a holistic way, we work with nature and not against her.

Dr. Jane has a friend who lives in the south of France. He is also British, and his name is Robert Eden. Robert has a large organic vineyard, and he practices biodynamic agriculture. His farming is in tune with nature. Robert uses wind turbines for energy and hand picks his grapes. He harvests the grapes during the period of a full moon for a special reason: The full moon moves the tide, pulling it in, and when this happens, the moon also draws sap up the vine and into the grape. This means when Robert picks the grapes at full moon, they are at their juiciest.

Sadly, despite his natural practices, Robert, like everybody else, is being affected by climate change and drought. He told Dr. Jane that "the drought is so bad that the vines are actually pulling the juice out of the grapes to keep themselves alive." Wherever we look, the effects of climate change are apparent.

Dr. Jane, like Robert, has also been doing her part. The Jane Goodall Institute has been working with farmers and has learned that shade-grown coffee is very good for the coffee itself. It gives it a better flavor. Additionally, shade-grown coffee is helping to restore the forest, attracting animals, birds, and plants back to their homes.

18.

ORGANIC FARMING

ACTIVITY

- Take to your backyard and start an organic garden. If you don't have a backyard, build a window box, try building a hanging vegetable garden, or search for a community garden where you can plant your own crops. These ingredients will be fresh and ready for use once they grow.

18.
NOTES



19.

FOOD AS ACTIVISM

"Do we really need always to be able to just get anything we want at any time just because we pay money for it? And do we ever think about the often forced child labor that's been used to grow some of these foods so that we can get them cheaply because the labor is cheap or even not paid for at all?"
—Jane Goodall

SUBCHAPTERS

- Eating Seasonally and Locally
- Urban Farming
- Going Vegetarian

CHAPTER REVIEW

When Dr. Jane was growing up, people lived from season to season. Dr. Jane looked forward to certain seasons for the fruits and vegetables they brought with them like ripe peaches and strawberries. Nowadays, however, people are able to buy food that has been grown thousands of miles away. We don't wait for the seasons like we used to. We can buy exotic, tropical fruits at any time, but at a terrible cost—fossil fuels burned for thousands of miles to bring the fruit and often unfair labor that goes into its production.

One of the ways that we can help the environment is through what we buy. Think about where your food comes from and choose what you purchase carefully. Two hopeful trends Dr. Jane has seen are an increase in locally grown food and farmers' markets where small family farms sell their organic produce. Farmers' markets are opportunities for farmers and buyers to get together and talk. Yes, the produce at a farmers' market costs a little bit more, but the satisfaction one gets from knowing the produce was grown holistically and sustainably warrants the extra expense. Dr. Jane sees purchasing food from the farmers' market as voting for a better future for children.

An encouraging sign that Dr. Jane has seen all around the world is urban farming. By growing food yourself, you can be sure that it is free from all contamination. Many people don't have a garden where they can grow food, but Dr. Jane has met people who grow food in window boxes in their city apartments. The move towards urban farming provides pesticide-free food and also greens up areas without nature.

Food activism goes beyond fruits and vegetables. It also has to do with the animals we eat and the way they are treated. When Dr. Jane first read about small cattle yards and putting pigs into awful pens in which they couldn't move, the next time she looked at a piece of meat on her plate she decided not to eat it. In fact, she resolved to never eat meat again. Meat was symbolic of fear, pain, and death, and she didn't want to eat that. She also thought about animals as sentient beings. She thought about how animals have personalities, minds, and emotions.

19.

FOOD AS ACTIVISM

Becoming a vegetarian isn't just about animal welfare. It's also about the destruction of the environment to grow grain to feed the animals we eat. Huge amounts of toxic waste are produced, including the methane gas from animals' digestive processes, and large amounts of water are wasted in the process. Being a vegetarian can be a massive help to improve the environment of our planet.

LEARN MORE

- Click here to find your local farmers' market. Visit one and talk with a farmer about his/her methods and ideas.
- Parents and guardians, has your child expressed interest in becoming a vegetarian? Click here to find out how you can support your child's decision and ensure he/she is getting all required nutrients.
- Click here to learn about 20 food activism organizations. Do some research and volunteer.

ACTIVITY

- Try eating a vegetarian diet for a week. Research alternative protein sources and replace the meat in your diet for seven days. After the weekend, consider adopting meatless Mondays!

19.

NOTES

20.

ADVOCACY STRATEGIES

"Eventually hopefully billions of people [will] all [be] making the right ethical choices in how they lead their lives each day. That is going to move us towards the kind of planet that we would like or not be ashamed to leave behind to our children."
—Jane Goodall

SUBCHAPTERS

- Make Responsible Decisions
- Act Locally
- The Power of Your Dollar
- Get the Facts
- Reconnect with Nature

CHAPTER REVIEW

Dr. Jane has shared a lot of information with you about the harm we've done to the planet. You might be feeling hopeless after hearing about all the problems we have to face, but there is so much you can do to help. You can start by thinking about the consequences of the small choices you make every day. What does your family buy? Where does it come from? How was it made? Did it come from very far away using a lot of fossil fuel? Could you buy the same thing made locally? Did it involve harm to animals? Once you start thinking about these questions, you might come to the conclusion that you should spend a little more in order to waste a little less.

Your efforts and endeavors might seem small, but as more people become aware and receive education in conservation, the better and healthier the earth will be. Dr. Jane hopes that soon billions of people will be making the right ethical choices in how they lead their lives each day.

Have you heard the phrase, "Think globally, act locally"? Dr. Jane advocates for the exact opposite. Why? Because if we think globally there is so much wrong on our planet. If we start thinking globally, we are filled with despair. However, if we twist it around and think locally, we realize there is something we can do. We can get together with other like-minded people and take action. We feel, see, and know that we're making a difference. Suddenly, we're filled with hope. People must start to understand that they hold power in their own hands, even if it doesn't feel like it.

20.

NOTES

21 & 22.

COMMUNICATION PARTS ONE & TWO

"The only way I know is to get people on your side and have sympathy. And I can't do that except by telling the right story at the right time."
—Jane Goodall

SUBCHAPTERS

- Tell Stories to Reach Their Hearts
- Reaching Their Hearts: Climate Change Skeptics
- Use Humor
- Presentations
- Nerves & Speaking from the Heart
- Communicating Findings You Can't Prove

CHAPTER REVIEW

Dr. Jane worked hard to become the powerful speaker she is today. She knew she had a gift of communication with writing, but she didn't know she had it in speaking.

Speaking and listening to people made Dr. Jane aware of one of the problems of successful advocacy: when people become too militant. Sometimes in fighting for their causes, people become too adversarial. Although that approach might play a role at some point, Dr. Jane doesn't think it's the ultimate solution.

Whenever she's speaking to someone, especially with someone who disagrees with her, Dr. Jane tries to build some kind of relationship. For example, if she knows the person has a dog, Dr. Jane will bring that up. The only way Dr. Jane knows to get people on her side is to have empathy for them.

When Dr. Jane encounters climate change skeptics, she never argues with them. If she argues with them, they don't listen. The only possible way to get them to listen is to reach their hearts. How does Dr. Jane do this? By telling stories. She tries to relate things to their own families, their own lives, and the future of their own children. Being funny doesn't hurt either, depending on the situation. If Dr. Jane can make people laugh at something, they're much more likely to listen to her than if she makes them angry.

21 & 22.

NOTES

23.

OPENING A DIALOGUE

"I think one of the big problems with science that has led to an awful lot of unintentional cruelty is this division between head and heart. And the perception that a good scientist must be totally objective and that emotion mustn't come into it—to me, that's very wrong."
—Jane Goodall

CHAPTER REVIEW

For Dr. Jane, the most important way to create change is not by confronting something head on. Rather, it is by meeting with people, listening to them, and understanding where they're coming from. Appeal to their hearts, either intellectually or emotionally. Compromises are okay, as long as you're not compromising your own values.

When Dr. Jane speaks with climate change skeptics or companies who are cruel to animals, some people are outraged. They ask, "How can you sit in a room with them? How can you drink a cup of coffee with them? How can you bear talking to them?" Dr. Jane replies that if you don't talk to people and if you don't try and find a way to communicate at some level, there will never be change.

SUBCHAPTERS

- Opening a Dialogue: Medical Researchers
- Opening a Dialogue: Robert Gallo
- Opening a Dialogue: Nebraska Farmers
- Speaking with President Trump

23.

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24.

THE NEXT GENERATION

"We are hurtling on a downward path towards the kind of planet that will no longer support human life. Maybe no life. Eventually the planet will recover. We won't. And the reason I have hope is because I do believe there's still a window of time."
—Jane Goodall

SUBCHAPTERS

CHAPTER REVIEW

Dr. Jane believes that parents should allow children to follow their passions. All children are different, but the most important thing for a parent is to support the interests of the child. Most of all, parents shouldn't force their children to do something because that can have the opposite effect the parents desire.

From all her observations of chimpanzees and from all that she has read of child psychologists, Dr. Jane knows that the first couple of years of life are tremendously important. The figures guiding a child through these early years don't have to be its birth parents. It can be anyone (remember Spindle in chapter 5 who adopted the orphan baby chimp?) so long as that person is always there for the child.

Dr. Jane has advice for young people who want to study animal behavior. First, she tells them that they must have a strong, unrelenting desire, because competition, funding, and disappointments are tough. Dr. Jane suggests volunteering in a program one summer to get a feeling for what it's like in the field. She warns that conservation science and animal behavior studies can be quite boring—learning time sampling, filling out check sheets, and recording data can be tedious. If a child volunteers on a project like and enjoys it, he or she will know if a future career as a scientist is suitable.

On the other hand, if you're somebody who cares passionately about wildlife and the environment, and you want to fight for something you care about, the first thing you should do is find out the facts. Next, find a group that really understands the facts and volunteer with them.

If young people lose hope, Dr. Jane believes we have no hope left. If we have no hope, we don't fight. If we don't fight for what we believe in, we give up. Dr. Jane feels there is still a window of time to right the wrongs we have done. She sees young people pushing towards a different way of thinking, and she has noticed companies adopting new ethical standards.

There is change in the air.

24.
NOTES

25.

MAKING GLOBAL CHANGE

"Over the years, it's become increasingly clear that only if we work with the local communities, only if they become our partners in conservation can we hope that conservation will work."
—Jane Goodall

SUBCHAPTERS

- The Jane Goodall Institute and TACARE
- Working With Local Communities
- Microcredit
- Family Planning & Human Population Growth
- Gender & Health
- Satellite Tech & Habitat Protection

CHAPTER REVIEW

Though Dr. Jane began her work with chimpanzees, she quickly realized that saving chimps required working with local communities. Because everything is interrelated, she knew that protecting the forest and educating people to understand their connection to it was essential. She began by helping the people living in villages surrounding Gombe. The Jane Goodall Institute's TACARE or "Take Care" approach provides local communities the tools needed to manage their resources for long-term growth and sustainability.

TACARE assembled a group of local Tanzanians who worked with non-government organizations (NGOs) in agriculture, in health, and in education. This group of local people went into the villages, sat down with the leaders and women in the village, and asked them what they thought TACARE could do to make their lives better.

At first, the program was criticized. People told Dr. Jane, "You can't do it all." They thought TACARE needed to pick a concentration—education, reforestation, agro-forest fuel, or agriculture. Dr. Jane, however, disagreed. Her time in the forest had taught her that everything is interrelated. It's no good taking one piece if you don't address the rest.

Tanzanian villagers hoped TACARE would help them grow more food. That meant restoring fertility to the overused farmland but without pesticides, chemical fertilizers, or herbicides. They wanted better health and education facilities, so TACARE began to work closely with the local Tanzanian government.

TACARE is now a leader in how community conservation can be done the right way across the globe.

25.

MAKING GLOBAL CHANGE

LEARN MORE

- Chimpanzee populations have been impacted by the growing human population in Tanzania. There are fewer than 345,000 chimps remaining in the wild today, down from millions in the decades prior. Knowing the ways chimpanzees are affected by human activity and deforestation, Dr. Jane partnered with Google Earth to capture the changes occurring in the Gombe National Park. The Jane Goodall Institute uses this satellite imagery to inform conservation decisions in a new and distinct way. Click here to learn more about Dr. Jane's satellite project in Tanzania.

25.

NOTES

26.

ROOTS & SHOOTS PART ONE

"We've let the planet down. There's no question about that. And we owe it to future generations to work with them to try and heal some of the harm we've inflicted."
—Jane Goodall

SUBCHAPTERS

- Genesis of Roots & Shoots
- Empowering Youth

CHAPTER REVIEW

Dr. Jane knows that if we want to conserve the environment, we have to work with local people. Unless local people are our partners in conservation, we may as well give up. Educating new generations is equally imperative. We need to teach them to be better stewards of the planet than past generations.

In 1991, Dr. Jane and her team were celebrating 30 years of research at Gombe. Dr. Jane went around to secondary and primary schools and talked to young people about the environmental problems and the forests of Tanzania. After her visits, a group of 12 secondary school students asked if they could come and meet Dr. Jane at her house in Dar es Salaam.

These 12 students were concerned about so many different problems. One of them was upset about the government's inaction in regards to the poaching of lions, giraffes, and elephants in Tanzania's national parks. Some of them were concerned about stray children who were homeless, and some were concerned about the pollution of the ocean and the destruction of coral reefs.

It was from this meeting that Roots & Shoots was born. In these students' discussion with Dr. Jane, the main message of the Roots & Shoots program materialized: Every individual matters. Every individual has a role to play. Every individual makes a difference.

In Roots & Shoots, each group identifies a service campaign to help their community. Campaigns can be about helping people or other animals, or helping the environment that we all share. Roots & Shoots is growing very fast in many countries. Dr. Jane thinks one of the reasons it's so successful is that it's youth-driven. While Roots & Shoots advises young people, it does not dictate to them what they should do. Roots & Shoots empowers youth, Dr. Jane's main hope for the future.

26.
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27.

ROOTS & SHOOTS PART TWO

"If we laugh, we laugh because we have an emotion that makes us... feel good. And it doesn't matter what your culture or religion. If you weep it can be from some deep feeling of sadness. And that can be shared even if you can't speak another language."
—Jane Goodall

SUBCHAPTERS

- One Human Family
- Naming Roots & Shoots
- Roots & Shoots at Work

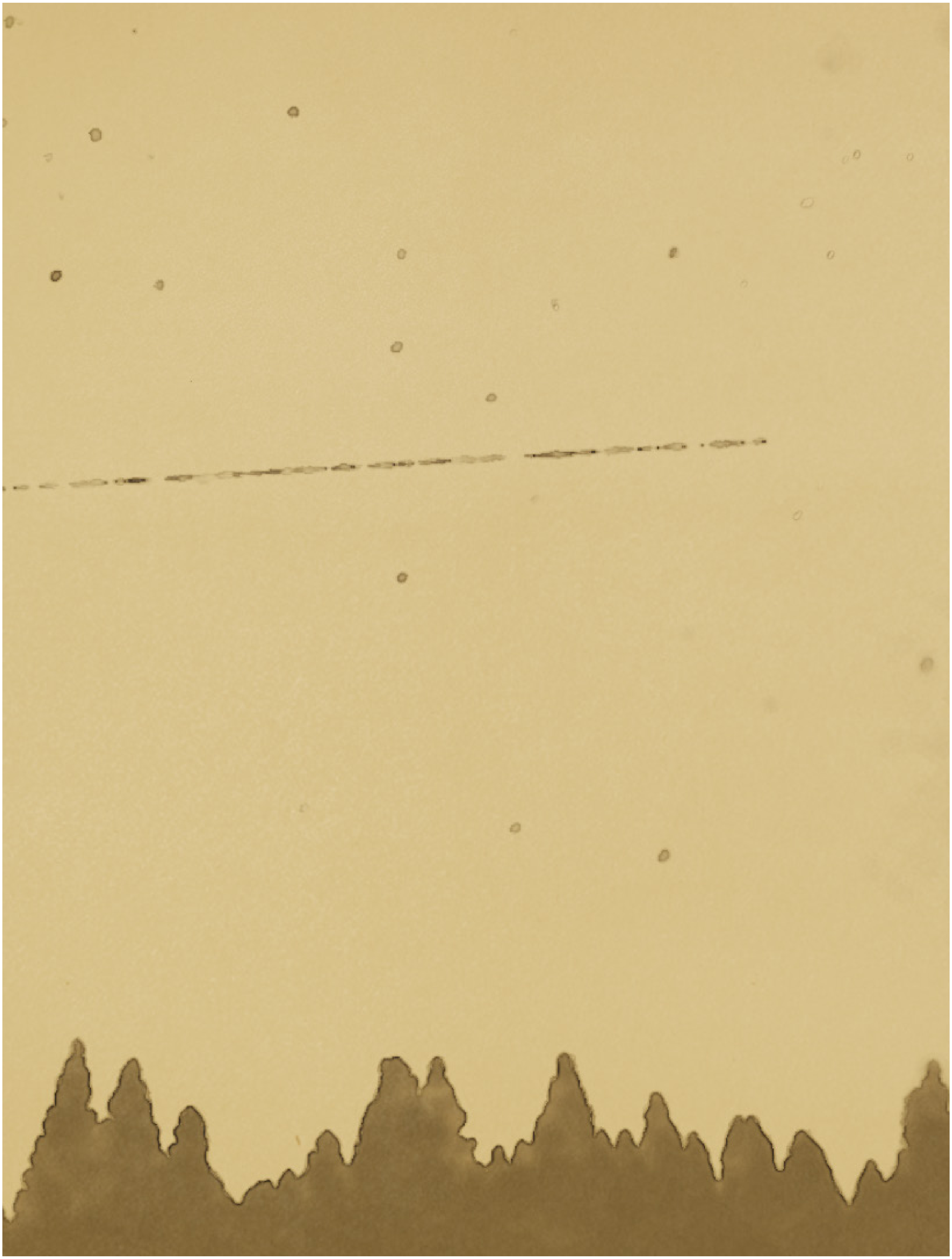
CHAPTER REVIEW

Dr. Jane feels that young people are beginning to understand that we are one human family. Roots & Shoots makes an effort to bring people together from different nations, different cultures, and different religions. The program illustrates that we are all interconnected and also imparts to young people that there is not a sharp line dividing us from other animals.

Have you wondered why the program is called Roots & Shoots? Close your eyes and think of a beautiful tree. Dr. Jane thinks of the beech tree she climbed as a child. The seed of her beech tree was very small. As it started to grow, little white roots materialized. The tiny roots seemed so small, so weak, so insignificant, but there was magic in that little seed. It contained a life force so powerful that those little roots could work through rocks and eventually push them aside in order to reach water. The little shoots—to reach the sunlight needed for photosynthesis—could work through cracks in a brick wall and eventually knock it down.

If we think of the rocks and the walls as all the problems we humans have inflicted on the planet, the roots and shoots are the things pushing past these problems. Hundreds of thousands of young people around the world are these roots and shoots working to make this world a better place.

27.
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28.

REASONS FOR HOPE PART ONE

"If people care and give nature time then nature can come back. It may not even be as it was before, but life can return. Nature will reassert itself."
—Jane Goodall

SUBCHAPTERS

- The Energy of Youth
- The Human Brain
- The Resilience of Nature
- Social Media

CHAPTER REVIEW

With all the suffering and harm she has seen, people often ask Dr. Jane if she has any hope for the future. The answer is yes, and Dr. Jane has several reasons for hope. The most important and meaningful reason for her is the young people of the planet. Dr. Jane always tries to visit schools when she travels. She encourages young people to come together and change the world.
Young people are changing the world as you read this.

Another reason for hope is the extraordinary human brain. We've used our brain for bad purposes, but we now have to use our intellect to solve the problems that have been created by it. Dr. Jane sees hope in all the ways technology has allowed us to live in greater harmony with nature. Some examples are the use of solar power and wind power. We still have a long way to go, and we still have to learn how to use these innovations without harming bird migrations or killing bats, but nevertheless, we're making big strides.

Dr. Jane's next reason for hope is the resilience of nature. Animals on the brink of extinction can bounce back. Plants can do this too if we give them the chance. We used to try and raise awareness about animal and plant decimation by sending out letters or going door to door, but now we can reach out to people we've never seen who share the same passions as we do. We can connect with these people through social media. If we bring voices together, they get louder and louder. Eventually these voices will reach politicians and big businesses who will be forced to listen.

28.

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29.

REASONS FOR HOPE PART TWO

"Every single one of us has that same indomitable spirit. We just have to allow it freedom. We just have to encourage it to grow. We just have to remember that every day every one of us makes a difference. And we have a choice as to what kind of difference we're going to make."
—Jane Goodall

SUBCHAPTERS

- The Indomitable Human Spirit
- A Call to Action

CHAPTER REVIEW

In this chapter, Dr. Jane shares the stories of three people who are examples of the indomitable human spirit.

The first is Chris Koch. Chris was born without legs and hands, yet he is so full of life. Chris believes he was put together this way for a reason. He wants to help others who have disabilities to understand that this is not the end and that they can lead a full, happy life despite the challenges they face. Chris also wants to help people who don't have disabilities to stop pitying those who do and to realize that the disabled have a role to play.

The second extraordinary person Dr. Jane has met is a man who lost a leg and an arm because of a landmine explosion in Cambodia. This man had always wanted to run marathons, so he overcame the pain in his legs. He actually ran the one of the toughest marathons in the world—across the Sahara Desert—on his prosthetic leg.

The third person who embodies the indomitable human spirit is Gary Haun. Gary lost his eyesight when he was 21. He went completely blind, and he cannot see light or dark. Gary decided he wanted to become a magician even though he couldn't see. He taught himself how to do tricks without vision, and he also goes cross-country skiing, scuba diving, and skydiving. Gary has also just taught himself to paint. He paints by touch and by feel, using a braille ruler and feeling the edges of the paper, while someone puts the color he wants on the end of his brush.

After learning about these people, Dr. Jane hopes you feel empowered. She hopes that you realize that you, too, have an indomitable spirit. You can make change in your own life every single day. You may not change the whole world, but the way you interact with your friends, with your parents, with animals, and with the environment all make a difference. When millions and billions of people are making these right, ethical choices and know that what they're doing makes a difference every day, we all begin to feel that we are playing a major part in creating a new awareness and a new way of thinking.

29.

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MASTERCLASS